

LA1247



3021B

Monolithic Linear IC

AM Electronic Tuner

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The LA1247 is a high-performance IC developed for AM electronic tuning systems. It performs all the functions needed for AM tuner systems and also provides auto search stop signal, local oscillation buffer output, low-level local oscillation. Moreover, the local oscillation is stable from LW to SW, facilitating multiband applications.

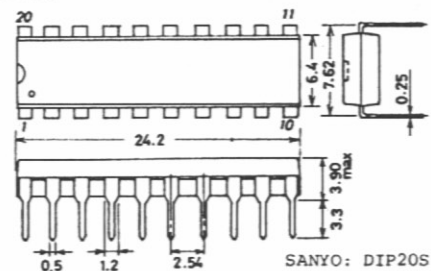
Functions

- RF amplification
- OSC (with ALC)
- Detection
- Signal meter drive output (also used as auto search stop signal)
- Others
- MIX
- IF amplification
- AGC
- Local oscillation buffer output

Features

- | | |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| 1. Narrow-band signal meter: | Usable as auto search stop signal (possible to make wide-band)
Signal meter output 1/2 frequency ± 1.5 kHz typ. |
| 2. Local oscillation buffer output: | Easy to design electronic tuning frequency display |
| 3. LSC (with ALC): | Stabilized oscillation output for varactor diode and improved tracking error |
| 4. RF amplification: | Excellent usable sensitivity (45 dB/m typ.) due to low noise transistor cascode connection |
| 5. MIX: | Highly resistant to spurious interference, IF interference due to double balanced type differential MIX (IF interference = 85 dB typ.) |
| 6. Low noise: | Good S/N (57 dB typ.) for medium input |
| 7. V_{CC} variation compensation: | Little variation in gain, distortion, etc. (8 to 16 V) |
| 8. Pop noise reduction: | Possible to reduce pop noise at the time of V_{CC} -on, mode-on by selecting AGC time constant |
| 9. Meeting AM stereo requirements: | Subchannel S/N is more improved as compared with the LA1245. |

Case Outline 3021B-D20SIC
(unit:mm)



Maximum Ratings at $T_a = 25^\circ\text{C}$

				unit
Supply voltage	V_{CC} max	Pin 8, 14	16	V
Output voltage	V_O	Pin 5, 7	24	V
Input voltage	V_I	Pin 3	5.6	V
Supply current	I_{CC} max	Pin 5 + 7 + 8 + 14	32	mA
Output high drive current	I_{18}	Pin 18	5	mA
	I_{20}	Pin 20	2	mA
Allowable power dissipation	P_d max	See Fig. 2	700	mW
Operating temperature	T_{opg}		-20 ~ +70	$^\circ\text{C}$
Storage temperature	T_{stg}		-40 ~ +125	$^\circ\text{C}$

Recommended Operating Condition at $T_a = 25^\circ\text{C}$

				unit
Recommended supply voltage	V_{CC}		12	V
Operating voltage range	V_{CC}		8 ~ 16	V

Operating Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 12\text{ V}$, $f_r = 1\text{ MHz}$, $f_m = 400\text{ Hz}$, at specified test circuit (based on application circuit).

			min	typ	max	unit
Current dissipation	I_{CC} (1)	quiescent	16.0	25.0	35.0	mA
	I_{CC} (2)	with 107 dB μ input	19.0	29.0	40.0	mA
Detection output	V_O (1)	with 23 dB μ input, mod. 30 %	-27.5	-23.0	-18.5	dBm
	V_O (2)	with 80 dB μ input, mod. 30 %	-15.5	-12.5	-9.5	dBm
Signal to noise ratio	S/N (1)	with 23 dB μ input, mod. 30 %	16	20		dB
	S/N (2)	with 80 dB μ input, mod. 30 %	52	57		dB
Total harmonic distortion	THD (1)	with 80 dB μ input, mod. 30 %		0.4	1.0	%
	THD (2)	with 107 dB μ input, mod. 30 %		0.3	1.0	%
Signal meter output	V_{SM} (1)	quiescent		0	0.5	V
	V_{SM} (3)	with 107 dB μ input	3.5	5.0	7.0	V
Input at signal meter output = 1 V	V_{IN} (1)	V_{SM} output 1V	20.0	26.0	32.0	dB μ
Local oscillation-buffer output	V_{osc}		380	530		mVrms

Reference Characteristics

			typ	unit
Signal meter output	V_{SM} (2)	with 40 dB μ input	2.5	V
Total harmonic distortion	THD (3)	with 112 dB μ input, mod. 30	2	%
Local oscillation fluctuation within a band	ΔV_{osc}	from V_{oscL} (522 kHz) to V_{oscH} (1647 kHz)	10	mVrms
Signal meter band width*	V_{SM-BW1}	with 80 dB μ input, 1/2 output frequency	± 1.5	kHz
	V_{SM-BW2}	with 80 dB μ input, 1/10 output frequency	-4.5/+7	kHz
Selectivity		± 10 kHz at 30 % mod.	45	dB
IF Interference		$f_r = 600$ kHz	85	dB
Image frequency interference ratio		$f_r = 1400$ kHz	40	dB
AM stereo subchannel	S/N	Subchannel S	50	dB

* BFB450C4 N (MURATA, JAPAN) was used as a narrow band filter.

(note) 0 dBm = 775 mV, 0 dB μ = 1 μ V.